Taxon: Dicliptera chinensis **Family:** Acanthaceae

Common Name(s): Chinese foldwing
double folding wing plant

Synonym(s): Dicliptera roxburghiana Nees
Justicia chinensis L. (basionym)

Assessor: No Assessor **Status:** Assessor Approved **End Date:** 20 Jun 2014

WRA Score: 9.0 **Designation:** H(Hawai'i) **Rating:** High Risk

Keywords: Naturalized, Agricultural Weed, Decumbent Herb, Dehiscent Capsules, Barbed Seeds

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	n
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides	y=-1, n=1	n
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	No evidence

Qsn #	Question	Answer
102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

Qsn #	Question	Answer
103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

Qsn #	Question	Answer
201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**High**
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 13 Jun 2014]	"Native: ASIA-TEMPERATE China: China Eastern Asia: Japan - Ryukyu Islands; Taiwan ASIA-TROPICAL Indo-China: Indochina"

Qsn #	Question	Answer
202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed]	

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[May occur over 1000 m elevation range, demonstrating environmental versatility] "Streamsides, trailsides; below 1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Bangladesh, India, Vietnam]."

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 13 Jun 2014]	"Native: ASIA-TEMPERATE China: China Eastern Asia: Japan - Ryukyu Islands; Taiwan ASIA-TROPICAL Indo-China: Indochina"

205	**Does the species have a history of repeated introductions outside its natural range?**	**n**
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[No evidence. A documented weed within its native range (China), but thus far only reported to be naturalized in the Hawaiian islands]

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Oppenheimer, Hank L. 2003. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30	"According to Wagner et al. (1990: 171), D. chinensis is naturalized in or near urban areas on Kaua'i and O'ahu but perhaps more widespread. It was recently reported from the Big Island (Staples et al., 2002: 3). On West Maui, it was collected along the side of a road in a rural area not far from the center of Wailuku. Material examined: MAUI: West Maui, Wailuku Dist, 'Ïao Valley, 146 m, 27 Nov 2000, Oppenheimer H110037."
	Staples,G.W., Imada, C.T., & Herbst, D.R. 2002. New Hawaiian plant records for 2000. Bishop Museum Occasional Papers 68: 3-18	"Dicliptera chinensis (L.) Juss. New island record This species is frequently confused (in the herbarium) with Blechum pyramidatum (Lam.) Urban [Syn. B. brownei Juss.]. When several specimens were recently reidentified in the Bishop Museum herbarium, the following specimen was found to represent a new island record for the Big Island. Material examined. HAWAI'I: Hämäkua Ditch, Läläkea, at the main weir, start of lower Hämäkua Ditch, 20° 04' N, 155° 25' W, elev. 1000 ft, 2 Aug 1996, D.R. Herbst 9792."
	Oppenheimer, H.. 2007. New plant records from Moloka'i, Lāna'i, Maui, and Hawai'i for 2006. Bishop Museum Occasional Papers 96:17-34	"Dicliptera chinensis (L.) Juss. New island record. Naturalized primarily in urban areas on Kaua'i, O'ahu (Wagner et al. 1999: 171), Maui (Oppenheimer 2003: 3–4, 2004: 8), and Hawai'i (Staples et al. 2002: 3), this herbaceous species was recently collected on Moloka'i, where it was noted to be uncommon. Compared to many other attractive species in this family, it has inconspicuous flowers and bracts and is not likely cultivated. Material examined. MOLOKA'I: Kala'e, 500 m, naturalized in lawn at base of Casuarina, 2 Nov 2006, Oppenheimer H110605."
	Oppenheimer, H. L. 2004. New Hawaiian plant records for 2003. Bishop Museum Occasional Papers. 79: 8-20	"Dicliptera chinensis (L.) Juss. Range extension. Naturalized on Kaua'i, O'ahu (Wagner et al., 1999: 171), West Maui (Oppenheimer, 2003: 3–4) and Hawai'i (Staples et al., 2002: 3), the following specimen represents a significant range extension to East Maui. Material examined: MAUI: East Maui, Makawao Distr, Mäliko Gulch, 366m, along streamside, 2 Mar 2003, Oppenheimer H30302."

Qsn #	Question	Answer
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawaii, naturalized primarily in or near urban areas, at least on Kauai and Oahu, but perhaps more widespread."

302	Garden/amenity/disturbance weed	n
	Source(s)	**Notes**
	Owen, M. D., & Zelaya, I. A. 2005. Herbicide-resistant crops and weed resistance to herbicides. Pest Management Science, 61(3), 301-311	[Agricultural weed] "This plant has become a serious weed problem in lowland orchards and is described to be naturally resistant to glyphosate."

303	Agricultural/forestry/horticultural weed	y
	Source(s)	**Notes**
	Owen, M. D., & Zelaya, I. A. 2005. Herbicide-resistant crops and weed resistance to herbicides. Pest Management Science, 61(3), 301-311	"Dicliptera chinensis Chinese foldwing (Dicliptera chinensis (L) Juss) is a member of the Acanthaceae and is indigenous to East Asia and Taiwan. This plant has become a serious weed problem in lowland orchards and is described to be naturally resistant to glyphosate."

304	Environmental weed	n
	Source(s)	**Notes**
	Owen, M. D., & Zelaya, I. A. 2005. Herbicide-resistant crops and weed resistance to herbicides. Pest Management Science, 61(3), 301-311	[Agricultural weed] "This plant has become a serious weed problem in lowland orchards and is described to be naturally resistant to glyphosate."

305	Congeneric weed	
	Source(s)	**Notes**
	Papa, J.C.M. 2008. Determinación de la eficacia de diferentes herbicidas para el control de Dicliptera tweediana. Para Mejorar la Producción 39: 92-94	[Another glyphosate resistant Dicliptera] "En las dos ultimas campañas una especie que ha llamado la atención por su presencia en los barbechos y cultivos estivales así como por su Baja sensibilidad a las dosis normales de uso de glifosato fue Dicliptera tweediana (familia acantáceas), conocida vulgarmente como "canario rojo", "ajicillo" o "coral del campo" (Nisensohn et al. 2007)." [Translation from Spanish: In the last two campaigns a species that has drawn attention for its presence in summer fallow and crops as well as for its low sensitivity to normal doses of glyphosate use was Dicliptera tweediana (family Acanthaceae)...] [Dicliptera tweediana var. flaviflora Stuck. is a synonym of Dicliptera squarrosa Nees]
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Several Dicliptera species are listed as weeds

Qsn #	Question	Answer
401	**Produces spines, thorns or burrs**	**n**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Sprawling or decumbent perennial herbs; stems 2-7 dm long. Leaves green, lower surface slightly paler, ovate, 2.5-13.5 cm long, sparsely strigillose, especially on the veins, cystoliths prominent on upper surface as white raised streaks the size of the hairs, petioles 1-3.5 cm long."

402	**Allelopathic**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

403	**Parasitic**	**n**
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	""Sprawling or decumbent perennial herbs; stems 2-7 dm long." [Acanthaceae]

404	**Unpalatable to grazing animals**	
	Source(s)	**Notes**
	Shaheen, H., Qureshi, R., Iqbal, S., & Qasem, M. F. 2014. Seasonal availability and palatability of native flora of Santh Saroola Kotli Sattian, Rawalpindi, Pakistan. African Journal of Plant Science, 8(2): 92-102	[Unknown for D. chinensis. Relates Dicliptera species are palatable] "Table 1. Inventory of native flora along with local names, family, part used, palatability, availability and animal preference." [Dicliptera roxburghiana palatable to goat, sheep, cows and donkeys]

405	**Toxic to animals**	**n**
	Source(s)	**Notes**
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No Dicliptera species listed

406	**Host for recognized pests and pathogens**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

407	**Causes allergies or is otherwise toxic to humans**	**n**
	Source(s)	**Notes**
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No reported evidence of toxicity in genus

408	**Creates a fire hazard in natural ecosystems**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Herbs 30–80 cm tall, annual or biennial." ... "Streamsides, trailsides; below 1800 m. Fujian" [No evidence, and unlikely given form and habitat of plant]
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Sprawling or decumbent perennial herbs; stems 2-7 dm long." ... "naturalized primarily in or near urban areas" [No evidence, and unlikely given form and habitat]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Hortipedia. 2014. Dicliptera chinensis. http://en.hortipedia.com/wiki/Dicliptera_chinensis. [Accessed 19 Jun 2014]	"The perennials prefer a sunny to half-shady situation on moderately moist soil. "
	WRA Specialist. 2014. Personal Communication	Grows both in full sunlight and in the understory and dense shade of landscape vegetation

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	**Notes**
	Hortipedia. 2014. Dicliptera chinensis. http://en.hortipedia.com/wiki/Dicliptera_chinensis. [Accessed 19 Jun 2014]	"The perennials prefer a sunny to half-shady situation on moderately moist soil." [Other specifics of soil preferences unknown]

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Sprawling or decumbent perennial herbs; stems 2-7 dm long."

412	Forms dense thickets	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"naturalized primarily in or near urban areas" [No evidence in the Hawaiian Islands]

501	Aquatic	n
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Herbs 30–80 cm tall, annual or biennial." ... "Streamsides, trailsides; below 1800 m." [Terrestrial]

502	Grass	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	Acanthaceae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Acanthaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Sprawling or decumbent perennial herbs; stems 2-7 dm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	No evidence

602	Produces viable seed	y
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Capsules ovoid, 6-7 mm long, short-villous. Seeds 4, discoid" [Presumably Yes in the Hawaiian Islands. Naturalized on several islands]

603	Hybridizes naturally	
	Source(s)	**Notes**
	Balkwill, K., Norris, F. G., & Balkwill, M. J. 1996. Systematic studies in the Acanthaceae; Dicliptera in southern Africa. Kew Bulletin 5 (1): 1-61	[Unknown for D. chinensis. Hybridization documented within genus] "D. heterostegiha as been collected in flower between February and September, with a slight peak in April. Ward 5442, a specimen collected near Durban, must be a hybrid with D. clinopodia, one of the species in the group with narrow bracts."

604	Self-compatible or apomictic	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Long, R. W. 1971. Floral polymorphy and amphimictic breeding systems in Ruellia caroliniensis (Acanthaceae). American Journal of Botany 58(6): 525-531	"Cleistogamy is common in angiosperms." ... "Cleistogamic flowers were found in all races of R. caroliniensis in both garden-grown and greenhouse cultures. This breeding system is important not only in Ruellia, but also in Aechmanthera, Blechum, Dicliptera, Eranthemum, Justicia, and Stenandrium and doubtless for other genera as well. Cleistogamy is probably, as a breeding system, as important in Acanthaceae as it is Poaceae and Orchidaceae." [Cleistogamy or automatic self-pollination describes the trait of certain plants to propagate by using non opening, self-pollinating flowers]

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Long, R. W. 1971. Floral polymorphy and amphimictic breeding systems in Ruellia caroliniensis (Acanthaceae). American Journal of Botany 58(6): 525-531	"Cleistogamic flowers were found in all races of R. caroliniensis in both garden-grown and greenhouse cultures. This breeding system is important not only in Ruellia, but also in Aechmanthera, Blechum, Dicliptera, Eranthemum, Justicia, and Stenandrium and doubtless for other genera as well." [Cleistogamy or automatic self-pollination describes the trait of certain plants to propagate by using non-opening, self-pollinating flowers. No need for specialized pollinators]

606	Reproduction by vegetative fragmentation	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

607	Minimum generative time (years)	1
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Herbs 30–80 cm tall, annual or biennial." [Annual. Capable of reaching maturity within one growing season]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	Capsules ovoid, 6-7 mm long, short-villous. Seeds 4, discoid" ... "naturalized primarily in or near urban areas" [Possibly. Growing in heavily trafficked areas]

702	Propagules dispersed intentionally by people	n
	Source(s)	**Notes**
	Oppenheimer, H.. 2007. New plant records from Moloka'i, Lāna'i, Maui, and Hawai'i for 2006. Bishop Museum Occasional Papers 96:17-34	"Compared to many other attractive species in this family, it has inconspicuous flowers and bracts and is not likely cultivated."

Qsn #	Question	Answer
703	**Propagules likely to disperse as a produce contaminant**	
	Source(s)	**Notes**
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"naturalized primarily in or near urban areas" [Unknown. Presence in and around human habitations could result in contamination of potted plants, soil, or other plant-related materials growing in the vicinity]

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Darbyshire, I., & Vollesen, K. 2007. The transfer of the genus Peristrophe to Dicliptera (Acanthaceae), with a new species described from eastern Africa. Kew Bulletin 62(1): 119-128	"Capsule broadly ellipsoid, ca. 6 mm, puberulent, 4-seeded, apex apiculate. Seeds circular in outline, ca. 2 mm in diam., covered with apically barbed papillae." [No adaptations for long distance wind-dispersal, but seed dispersal by dehiscence of capsules may be aided by strong winds]

705	**Propagules water dispersed**	**n**
	Source(s)	**Notes**
	Singh, V. & Jain, D.K. 2006. Text Book of Botany: Angiosperms. Second Edition. Rastogi Publications, Meerut, India	[Not adapted for water dispersal, but secondary movement by water may infrequently occur] "Seeds are dispersed by explosive mechanism of the capsules (e.g., Ruellia and Thunbergia) or by adhesion of recurved spines present on the surface of the seeds to feathers or furs of birds and animals (e.g., Blepharis and Dicliptera) or sometimes by water (e.g., Acanthus)."

706	**Propagules bird dispersed**	**n**
	Source(s)	**Notes**
	Singh, V. & Jain, D.K. 2006. Text Book of Botany: Angiosperms. Second Edition. Rastogi Publications, Meerut, India	"Seeds are dispersed by explosive mechanism of the capsules (e.g., Ruellia and Thunbergia) or by adhesion of recurved spines present on the surface of the seeds to feathers or furs of birds and animals (e.g., Blepharis and Dicliptera) or sometimes by water (e.g., Acanthus)." [Possible external dispersal by birds, but not adapted for consumption & internal dispersal]
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Not fleshy-fruited, or adapted to ornithochory] "Capsule broadly ellipsoid, ca. 6 mm, puberulent, 4-seeded, apex apiculate. Seeds circular in outline, ca. 2 mm in diam., covered with apically barbed papillae."

707	**Propagules dispersed by other animals (externally)**	**y**
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	"Capsule broadly ellipsoid, ca. 6 mm, puberulent, 4-seeded, apex apiculate. Seeds circular in outline, ca. 2 mm in diam., covered with apically barbed papillae." [Barbed papillae on seeds may aid in external attachment]

Qsn #	Question	Answer
	Singh, V. & Jain, D.K. 2006. Text Book of Botany: Angiosperms. Second Edition. Rastogi Publications, Meerut, India	"Seeds are dispersed by explosive mechanism of the capsules (e.g., Ruellia and Thunbergia) or by adhesion of recurved spines present on the surface of the seeds to feathers or furs of birds and animals (e.g., Blepharis and Dicliptera) or sometimes by water (e.g., Acanthus)."

708	Propagules survive passage through the gut	n
	Source(s)	**Notes**
	Singh, V. & Jain, D.K. 2006. Text Book of Botany: Angiosperms. Second Edition. Rastogi Publications, Meerut, India	[Unlikely. No adaptations for consumption or internal dispersal] "Seeds are dispersed by explosive mechanism of the capsules (e.g., Ruellia and Thunbergia) or by adhesion of recurved spines present on the surface of the seeds to feathers or furs of birds and animals (e.g., Blepharis and Dicliptera) or sometimes by water (e.g., Acanthus)."

801	Prolific seed production (>1000/m2)	
	Source(s)	**Notes**
	Wu, Z. Y., P. H. Raven & D. Y. Hong, (eds). 2011. Flora of China. Vol. 19 (Cucurbitaceae through Valerianaceae, with Annonaceae and Berberidaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Unknown] "Herbs 30–80 cm tall, annual or biennial." ... "Capsule broadly ellipsoid, ca. 6 mm, puberulent, 4-seeded, apex apiculate. Seeds circular in outline, ca. 2 mm in diam., covered with apically barbed papillae."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	**Notes**
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 20 Jun 2014]	[Unknown for D. chinensis. Other Dicliptera species have orthodox seed storage, which may allow them to form a persistent soil seed bank] "Dicliptera capitata Milne-Redh. Orthodox 2.03g Germ Dicliptera paniculata (Forssk.) I.Darbysh. Orthodox 1.055g Germ"

Qsn #	Question	Answer
803	**Well controlled by herbicides**	**n**
	Source(s)	**Notes**
	Owen, M. D., & Zelaya, I. A. 2005. Herbicide-resistant crops and weed resistance to herbicides. Pest Management Science, 61(3), 301-311	"Dicliptera chinensis Chinese foldwing (Dicliptera chinensis (L) Juss) is a member of the Acanthaceae and is indigenous to East Asia and Taiwan. This plant has become a serious weed problem in lowland orchards and is described to be naturally resistant to glyphosate.89 The resistance was attributed to higher EPSPS activity that was further elevated by glyphosate. Increased EPSPS mRNA and protein were observed 8 h after glyphosate treatment and gene amplification was apparently not a factor. Selection pressure from repeated glyphosate applications in the orchards caused this plant to increase in prominence as a weed, but there was no evidence that transgenic crops contributed to the resistance."
	Yuan, C. I., Chaing, M. Y., & Chen, Y. M. 2002. Triple mechanisms of glyphosate-resistance in a naturally occurring glyphosate resistant plant Dicliptera chinensis. Plant Science, 163(3), 543-554	"Dicliptera cliinensis Juss. is a unique annual plant that is naturally resistant to the herbicide glyphosate."

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown, but manual control often results in breaking of lateral stems without complete uprooting of parent root system. Plants are able to grow back without complete removal of root system.

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Can grow in temperate and tropical climates
• Naturalized in the Hawaiian Islands
• A serious weed problem in lowland orchards
• Other Dicliptera species are regarded as weeds
• Shade tolerant
• Reproduces by seeds, which are dispersed by a dehiscent capsule and by adhering to animals with barbed papillae
• Self-compatible (with cleistogamous flowers)
• Annual or perennial (able to reach maturity in 1 year)
• Possibly tolerant of and able to resprout after mechanical damage

Low Risk Traits
• Unarmed (no spines, thorns or burrs)
• No reports of toxicity
• Inconspicuous flowers makes intentional planting and cultivation for ornamental purposes unlikely